

REMARKS

Reconsideration of the above-identified application as amended respectfully is solicited on behalf of Applicants. With the instant response, two (2) claims are amended. A complete copy of the amended claim program is annexed hereto.

It is noted that, claims 1-5, 9, and 10 have been rejected under 35 U.S.C. §102(b) based upon a public use or sale of the AI Technologies TP7609 material.

However, each of the independent claims independent claims 1 and 9 recite a thermally-conductive material which is form-stable at normal room temperature in a first phase, but which is conformable in a second phase to the interface surfaces which may define the bondline or other joint or the thermal management assembly. The transition temperature from the first phase to the second phase, which may be between about 60-80°C (*See* claims 12, 15, and 18), is within the operating temperature range of the electronic component.

In contrast, the AI Cool Pad TP7609 data sheet reports a glass transition temperature of -55°C. Accordingly, the TP7609 material will be in the same physical phase at room temperature as at the operating temperature of the electronic component. That is, unlike the claimed phase change material (PCM), the AI TP7609 material exhibits no phase change between room temperature and the operating temperature of the component.

In view of this difference, independent claims 1 and 9 are believed to be novel over the art made of record. *See In re Bond*, 15 U.S.P.Q.2d 1566, 1567 (Fed. Cir. 1990), *citing Diversitech Corp. v. Century Steps, Inc.*, 7 U.S.P.Q.2d 1315, 1317 (Fed. Cir. 1988) (for a prior art reference to anticipate in terms of 35 U.S.C. § 102, every element of the claimed invention must be identically shown in the single reference); *See also In re Spada*, 15 U.S.P.Q.2d 1655, 1657 (Fed Cir. 1990) (rejection for anticipation requires that all the elements of the claimed invention be described in a single reference, and that the reference describe the claimed invention sufficiently to have placed one of ordinary skill in the art in possession of it). Dependent claims 4-5 and 10 further describe the independent claims, and likewise should be considered novel.

Claims 1-5, 9, and 13 have been rejected under 35 U.S.C. § 103(a) as being unpatentable over the Leung *et al.* article. Leung *et al.* has been cited as disclosing epoxy films used as thermal interfaces having a transition from a glassy to a rubber phase in the temperature range of 60-200°.

Indeed, and with reference to col. 2 bridging col. 3 of Leung *et al.*, it may be appreciated that the described epoxy film is a thermoset and, in that regard, exhibits a phase transition from a glassy to a rubbery phase. In contrast, independent claim 1 and 9 as amended describe a material which exhibits a phase transition from a first phase to a flowable second phase. [See Bunyan *et al.*, U.S. Patent No. 6,054,198, at col. 7, ll. 14-18].

To that extent that this difference might be considered trivial or otherwise lacking in patentable import, it is submitted that the use of the claimed PCM exhibiting a transition from a first phase to a flowable second phase offers advantages over a thermoset material such as contemplated by Leung *et al.* Particularly, the use of the claimed PCM allows the provision of a thermal interface which is liquid or semi-liquid in the second phase for grease-like conformability which is improved over that of a non-flowable, rubbery thermoset material. However, the claimed PCM, in being form stable in its first phase, offers comparable handability and ease of use as the thermoset materials disclosed by Leung *et al.*

Accordingly, it is submitted that independent claims 1 and 9 should be considered allowable as properly distinguishing over the Leung *et al.* reference. Dependent claims 2-5 and 13 further describe the independent claims and therefore should be considered allowable for the reasons given in connection therewith.

Lastly, it is noted that claims 1-13 have been rejected under 35 U.S.C. § 103(a) as being unpatentable over the TP7608 and TP7609 materials sold by AI Technologies in view of Whitfield *et al.*, U.S. Patent No. 4,299,715. The Whitfield *et al.* reference has been cited as disclosing filled waxy materials that are solid at room temperature but molten at 50-60°C. The AI materials have been cited as diamond-filled thermoplastic sheets which are applied using a release sheet. The Examiner is of the opinion that it would have been obvious to have produced the thermal interface sheets of AI Technologies using the materials taught by Whitfield.

Considering firstly the TP7608 material, the AI data sheet reports the same glass transition temperature for this material as the TP7609 material previously cited by the Examiner. Accordingly, neither of the TP7608 or TP7609 materials exhibits a phase change from room temperature to the operating temperature of the electronic component.

As to the Whitfield materials, those materials are formulated to be excoriable such that they can be applied by rubbing. [See, Whitfield *et al.*, U.S. Patent No. 4,299,715, at col. 4, ll. 62-66]. In view of the excoriable nature of the Whitfield material, it is submitted that such material

could not be formed into a film, similar to the AI TP7608 and TP7609 materials or otherwise, within the claimed thickness range of 1-10 mils which is free-standing without the use of a separate reinforcement layer. Indeed, Whitfield *et al.* contemplates impregnating its material into a fabric to form a gasket. [col. 2, ll. 57-59].

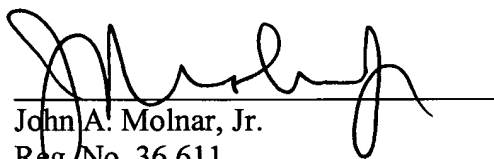
Moreover, although Whitfield *et al.* may not, as stated by the Examiner, be restrictive to the method of application, it does not appear to either teach or suggest that its excoriable materials are sufficiently form stable such that they could be supplied as free standing films. Indeed, in being silent as to this point, and further in explicitly teaching a myriad of other application methods for its materials, Whitfield *et al.* may be considered to fairly teach against the use of its materials as free standing films.

Taken collectively, the cited references appear to stand for no more than PCM's and free standing films of non-PCM materials may been known separately in the art. That no one yet had suggested formulating a PCM for use as a free standing film in the claimed manner, however, is suggestive that no one had yet to appreciate the desirability thereof. *See Fromson v. Citiplate Inc.*, 5 U.S.P.Q.2d 1198, 1203-04 (Fed. Cir. 1987) (although he knew of the existence of anodized plates and of the process of silication, ... [t]he fact that he did not use anodization in making the plates he sold shows that he did not appreciate its significance or was unsuccessful in implementing it); *See also Panduit Corp. v. Dennison Mfg. Corp.*, 1 U.S.P.Q.2d 1593, 1601 n. 25 (Fed. Cir. 1987) (in simple truth, Dennison and others had all the prior art elements available for years, and still do, and always will). Rather, it had remained for the Applicants to recognize that PCM's could be formulated to be free standing in a thin film form.

Thus, it is submitted that the thermal interface sheets taught by AI Technologies could not be formed from the Whitfield *et al.* materials in the manner proposed by the Examiner. Alternatively, it is submitted that, in view of the teachings of Whitfield *et al.*, one of ordinary skill in the art would not have been motivated to combine the references in that manner. Independent claim 1 and 9 therefore should be considered to properly distinguish over the art made of record. Claims 2-8 and 10-13 further describe claims 1 and 9, and therefore should be considered allowable for the reasons given in connection therewith.

In view of the foregoing remarks, wherein the claim program as amended has been shown to clearly define the claimed invention as being novel and nonobvious over art made of record, the issuance of a Notice of Allowance is earnestly solicited.

Respectfully submitted,



John A. Molnar, Jr.

Reg. No. 36,611

PARKER-HANNIFIN CORPORATION

6035 Parkland Boulevard

Cleveland, OH 44124-4141

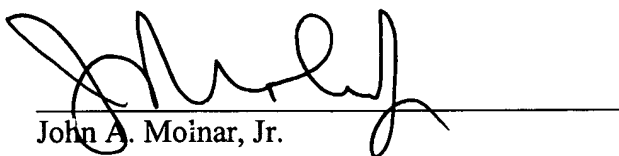
Voice: (216) 896-2212

Fax: (216) 896-4027

E-mail: jmolnar@parker.com

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John A. Molnar, Jr.